



A Simple Method for Thoracotomy Closure Avoiding Intercostal Nerve Damage

İnterkostal Sinir Hasarını Önleyen Basit Bir Toraks Kapama Yöntemi

Thoracotomy Closure Method

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Özet

Torakotominin kapatılması sırasında interkostal sinir hasarının ciddi postoperatif ağrıya yol açtığı bilinmektedir. Torakotomi açılması ve kapatılması sırasında interkostal siniri koruyan basit bir yöntem önerilmektedir. Bu manevra ile interkostal sinir kompresyonunun önlenebileceği düşünülmektedir.

Anahtar Kelimeler

Torakotomi; İnterkostal Sinirler; Postoperatif Ağrı

Abstract

It is well known that intercostal nerve damage during thoracotomy closure causes severe postoperative pain. A simple closure technique is proposed for intercostal nerve-sparing during thoracotomy opening and closure. We think that this maneuver may avoid intercostal nerve compression.

Keywords

Thoracotomy; Intercostal Nerves; Postoperative Pain

DOI: 10.4328/JCAM.3110

Received: 26.11.2014 Accepted: 09.12.2014 Printed: 01.09.2016

J Clin Anal Med 2016;7(5): 589-90

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Introduction

Posterolateral thoracotomy is the standard incision performed in many thoracic surgical procedures. Severe pain is one of the common problems after thoracotomy, and it is propounded that intercostal nerve damage stimulates post-thoracotomy pain [1]. Increased pain may lead sputum retention and atelectasis which results in prolonged hospitalization. Here, we attempted to describe a simple technique which may avoid compression of the intercostal nerve, thus leading less pain in the postoperative period.

Material and Method

In the course of thoracotomy, the intercostal neurovascular bundle is separated at the line of the periosteum by an incision performed just below the rim of the 5th rib. Cautery or periosteal elevator (rougine) is used to incise the attachments of the intercostal bundle from the periosteum. There is no need for complete or partial dissection of the intercostal muscle. Then, intercostal muscle is raised above the rib in order to protect the intercostal nerve before rib spreader is placed (Figure 1). In this manner, it is intended to prevent pressure on intercostal nerve during chest retraction.

Completing the intrathoracic surgical procedure, a rib approximator is placed and the intercostal bundle is positioned on the upper part of the 5th rib. In order to fix the approximated ribs to one another, the intercostal bundle is sutured continuously to the caudal intercostal muscle (Figure 2). Then, two or three separated fixation sutures are placed in between intercostal bundles. The muscles of the thoracic wall are sutured properly after removal of the costal approximator,

Discussion

Most surgeons prefer to close the thorax with pericostal sutures. In this usual approach, sutures are passed from the upper border of the rib of the lower intercostal space (seventh rib if the fifth space was opened) to the upper border of the rib corresponding to the space. Many authors agree that this type of closure causes serious post-thoracotomy pain, and therefore constitutes a major reason for postoperative morbidity [2-5]. Besides conventional medication, many attempts were made to decrease the post-thoracotomy pain such as epidural or spinal analgesia and intercostal or paravertebral nerve blockage. These methods are somewhat useful, but preventing intercostal nerve damage during rib retraction seems more rationalistic. In the literature, Cerfolio and colleagues [6] described a technique mainly consisted of intracostal sutures (sutures placed on top of the fifth rib and through the small holes drilled in the bed of the sixth rib) and harvesting of intercostal muscle flap before chest retraction. Bayram et al. [7] recommended closing the thorax by drilling two holes into the ribs which sutures were passed through these holes. They concluded that thoracotomy closure by a technique that avoids intercostal nerve compression significantly decreases post-thoracotomy pain.

Our technique is based on the protection of the intercostal nerve in an easier way. It takes no longer time and don't require any additional equipment. Since we do not fully harvest the intercostal muscle or skeletonize the rib, unintentional fractures are less likely to be faced. Of course, comparative studies are needed to clarify the efficacy of this method.

We believe that this technique may protect intercostal nerve

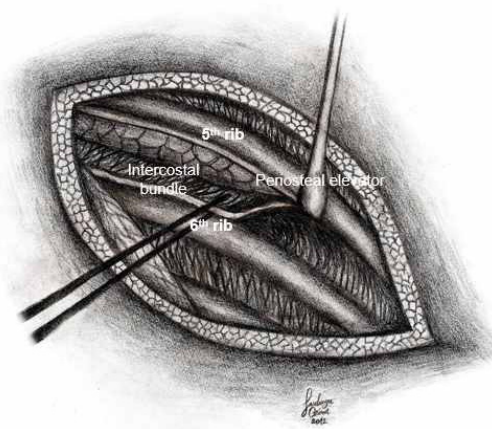


Figure 1. The intercostal muscle below the 5th rib is detached from the periosteum using a periosteal elevator, avoiding any damage to the intercostal nerve.

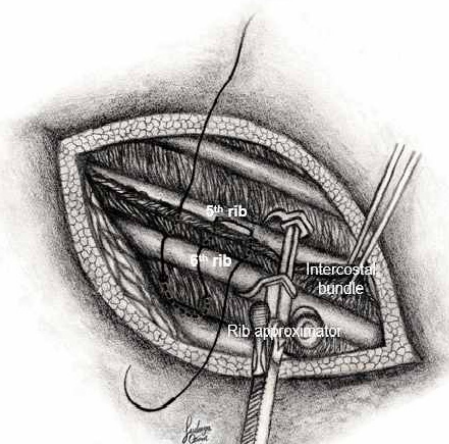


Figure 2. During closure of the thorax, 1/0 polyglactin sutures are passed continuously from the intercostal bundle to the caudal intercostal muscle. All effort is taken not to compress or crush the nerve.

from compression during and after thoracotomy. Further studies are needed to evaluate the effectiveness of this simple method.

Competing interests

The authors declare that they have no competing interests.

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How to cite this article:

Çağırıcı U, Akçam İ. A Simple Method for Thoracotomy Closure Avoiding Intercostal Nerve Damage. *J Clin Anal Med* 2016;7(5): 589-90.